BEFORE THE PUBLIC UTILITIES COMMISSION

OF THE STATE OF HAWAII

In the Matter of	)	
	)	
PUBLIC UTILITIES COMMISSION	)	DOCKET NO. 2008-0273
	)	
Instituting a Proceeding to Investigate the Implementation of Feed-in Tariffs	)	
	)	

FINAL STATEMENT OF POSITION AND PROPOSAL FOR FEED-IN TARIFF OF ZERO EMISSIONS LEASING LLC

AND

CERTIFICATE OF SERVICE

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FINAL STATEMENT OF POSITION AND PROPOSAL FOR FEED-IN TARIFF OF ZERO EMISSIONS LEASING LLC

ZERO EMISSIONS LEASING LLC ("Zero Emissions") respectfully submits this Final Statement of Position in support of Zero Emissions' Proposal for Feed-in Tariff (attached as Exhibit A) and regarding each of the Issues set forth in the Commission's *Order Approving The HECO Companies' Proposed Procedural Order, As Modified* in the above-referenced docket.

FINAL STATEMENT OF POSITION IN SUPPORT OF PROPOSAL FOR FEED-IN TARIFF

I. The Commission Should Adopt a Feed-in Tariff That Encourages Rapid Development of Large-Scale Renewable Generation at Low Cost to the Public.

A. The HCEI Agreement calls for adoption of a feed-in tariff that encourages rapid development of large-scale renewable generation at low cost to the public.

The Hawaii Clean Energy Initiative Agreement ("HCEI Agreement")[1] calls for adoption of a feed-in tariff that encourages rapid development of large-scale renewable generation at low cost to the public. The HCEI Agreement says that the State of Hawaii wants:

- Rapid development of renewable generation ("implement feed-in tariffs as a method of accelerating the acquisition of renewable energy"[2])
- Development of large-scale renewable generation ("move more decisively and irreversibly toward indigenously produced renewable energy"[3])
- Low cost to the public ("lower costs than would be incurred using imported fossil fuels"[4])

A true feed-in tariff, like that proposed by a group of Intervenors[5] (the "Intervenors' FIT"), encourages the rapid development of large-scale renewable generation at low cost to the public. The Intervenors' FIT achieves such development by creating customer certainty (the utility's obligation to interconnect) and revenue certainty (the utility's obligation to take and pay for renewable energy delivered to the utility) that encourages investment in renewable energy projects. The Intervenors' FIT replaces completely the Competitive Bidding[6] rates that now apply *de facto* to all renewable generation other than customer self-generation $\leq$ 100 kW covered by net energy metering ("NEM").

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[1] Energy Agreement Among the State of Hawaii, Division of Consumer Advocacy of the Department of Commerce and Consumer Affairs, and the Hawaiian Electric Companies (October 20, 2008)
[2] HCEI Agreement at 17.
[3] *Id.* at 1.
[4] *Id.* at 1.
[5] Alexander & Baldwin/Hawaiian & Commercial Sugar Division, Blue Planet Foundation, Clean Energy Maui LLC, Hawaii BioEnergy, Inc., Hawaii Solar Energy Association, Life of the Land, Solar Alliance, Sopogy, Inc. and Zero Emissions Leasing LLC.
[6] Decision & Order No. 23121, in Docket No. 03-0372 (December 8, 2006)

A feed-in tariff like that proposed by the HECO Companies[7] and the Consumer Advocate[8] (the "HECO/CA FIT")[9] contains speed limits ("annual targets") and size limits (≤ 100 kW, ≤ 500 kW for solar PV) designed to ***discourage*** the rapid development of large-scale renewable generation at low cost to the public. The HECO/CA FIT discourages such development by perpetuating Competitive Bidding rates for renewable generation > 100 kW (> 500 kW for solar PV). The HECO/CA FIT also is designed to ***discourage*** the rapid development of small-scale generation at no cost to the public, by proposing elimination of net energy metering for customer self-generation ≤ 100 kW.

B. The main issue in this docket is whether the Commission will discourage or encourage renewable generation development in Hawaii through the establishment of a feed-in tariff that contains or does not contain speed and size limits on such development.

This docket presents the Commission with a fundamental question relating to the speed, size and cost to the public of renewable generation development in the State of Hawaii: whether the Commission will discourage or encourage such development through the establishment of a feed-in tariff that contains or does not contain speed and size limits on such development.

If Hawaii wants rapid development of large-scale renewable generation at low cost to the public, the Commission needs to establish a feed-in tariff, like the Intervenors' FIT, that does not contain speed and size limits on development of renewable generation. If Hawaii wants slow development of small-scale renewable generation at high cost to the public, the Commission may either do nothing or establish a feed-in tariff like the

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[7] Hawaiian Electric Company, Inc., Maui Electric Company, Ltd. and Hawaii Electric Light Company, Inc.
[8] Division of Consumer Advocacy, Department of Commerce and Consumer Affairs
[9] Joint Proposal on Feed-in Tariffs of the HECO Companies and Consumer Advocate (the "HECO/CA Proposal") and KEMA, Inc., *HECO Feed-In Tariff Program Plan* (the "HECO Plan"), filed December 23, 2008 (the HECO/CA Proposal and the HECO Plan collectively referred to as the "HECO/CA FIT").

HECO/CA FIT that contains speed and size limits on development of renewable generation.

Hawaii regulatory policy presently discourages rapid development of large-scale renewable generation at low cost to the public. Competitive Bidding allows the utility to discourage such development by driving down the contract rate, paid by the utility to an independent renewable generator, to the point where a developer has essentially no economic incentive to develop large-scale renewable generation that produces electricity for utility distribution, and to the point where the renewable generation cannot pay for the grid improvements necessary for such development. Because Competitive Bidding essentially negates any obligation of the utility to take delivery of electricity from large-scale renewable generation (except at an economically disadvantageous rate for the renewable generator), the utility is able to further discourage such development by delaying implementation and expenditures for grid improvements necessary for such development.

A true feed-in tariff that does not contain speed and size limits, like Intervenors' FIT,[10] encourages rapid development of large-scale renewable generation at low cost to the public, by obliging the utility to take and pay for renewable electricity at a FIT contract rate that gives developers an economic incentive to develop large-scale renewable generation of electricity for utility distribution, and that allows a renewable generator, with economically rational interconnection costs, to pay for grid improvements necessary for such development. A fake feed-in tariff that contains speed and size limits, like the HECO/CA FIT, is designed to achieve just the opposite. It perpetuates

[10] Zero Emissions Proposal for FIT would amend the Intervenors' FIT by removing entirely the size limitations of 20 MW for Photovoltaic Generating Facilities and Concentrating Solar Power Facilities on the islands of Oahu, Maui and Hawaii, and for Onshore Wind Generating Facilities.

Competitive Bidding that allows the utility to discourage large-scale renewable generation development, by putting the utility under ***no*** obligation to take and pay for renewable electricity at a rate that gives the developer an economic incentive to develop such generation, and by allowing the utility to delay implementation and expenditures for grid improvements necessary for such development.

If Hawaii wants rapid development of large-scale renewable generation at low cost to the public, the Commission should adopt a true feed-in tariff, like Intervenors' FIT, that obliges the utility to relinquish its ability – through Competitive Bidding and delay of implementation and expenditures for grid improvements necessary for such development – to discourage such development. If the Commission does not want to adopt a true feed-in tariff, like Intervenors' FIT, then the public would be better off if the Commission adopts no feed-in tariff, rather than adopt the fake HECO/CA FIT. The public would be better off with no feed-in tariff, than with the fake HECO/CA FIT, because: (1) no feed-in tariff would leave intact net energy metering (NEM) that encourages rapid development of small-scale renewable customer-generation at no cost to the public, and (2) adoption of the fake HECO/CA FIT would be a political barrier to legislative adoption of a true feed-in tariff.

II. The Intervenors' FIT is Proven to Succeed.

The Intervenors' FIT, containing no speed or size limits, is modeled after the German FIT, also containing no speed or size limits, that is ***proven to succeed*** in encouraging the rapid development of large-scale renewable generation of utility-

distributed electricity at low cost to the public. The HECO Feed-In Tariff Program Plan[11], submitted in support of the HECO/CA FIT, acknowledges that:

> Feed-In Tariffs (FITs) have driven rapid renewable energy market growth ...
>
> ...The world's leading wind energy and solar energy markets, such as Germany and Spain, have relied on FITs to rapidly expand their installed renewable energy capacity. At the end of 2007, Germany and Spain had installed a total of 37,768 MW of wind power, or 2.5 times more capacity than the United States. [footnote omitted] This is particularly remarkable since Spain and Germany represent only 9.2 percent of total U.S. landmass combined. Both countries have also rapidly expanded the share of renewable energy in their portfolios. Germany, for example, expanded its share of renewable electricity from approximately 6 percent in 2000 to over 14 percent in 2007, reaching its 2010 goal of 12.5 percent three years ahead of schedule.

Feed-in tariffs like Intervenors' FIT, not subject to speed and size limits, are proven to succeed at achieving such development at low cost to the public. The German FIT, on which Intervenors' FIT is modeled, has achieved 14% renewable energy for Germany at an additional cost, estimated by the German federal government, of about 1.4¢ per kilowatt-hour to German ratepayers.[12]

Feed-in tariffs, like Intervenors' FIT, work because they send a clear and firm market signal of the price at which renewable energy can and will be sold, and because the amount of renewable generation elicited by that price signal is transparent and known to all, especially by the Commission that is setting the price. The German FIT success shows that the FIT rate should be set initially at a level calculated not just to give the developer a reasonable profit on top of the developer's costs, but at a level calculated to give investors a strong incentive to make the investments needed to achieve rapid development of large-scale renewable generation. As the successful German FIT

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[11] HECO Plan at 1.

[12] See notes 42 and 43 and accompanying text relating to costs to ratepayers of achieving Hawaii RPS goals.

experience shows, if the FIT rates are initially set too low, too high, or just right, the Commission will find that out within the first 2 or 3 years based on how many MW of generating capacity are placed in service at those FIT rates, and can then adjust the FIT rates if necessary to elicit such rapid development and still keep the cost low to the ratepayers.

III. The HECO/CA FIT is designed to fail because it perpetuates Competitive Bidding rates that have been proven to fail.

The HECO/CA FIT is ***designed to fail*** in encouraging the rapid development of large-scale renewable generation of utility-distributed electricity at low cost to the public because the HECO/CA FIT perpetuates Competitive Bidding rates that are ***proven to fail*** in encouraging such development.

A. The HECO/CA FIT perpetuates Competitive Bidding that is proven to fail in encouraging rapid development of large-scale renewable generation.

Fifteen years ago, California pursued the policy path now being trod by Hawaii, moving from independent generation contracted at a long-term standard offer rate (similar to a feed-in tariff rate), to independent generation contracted at a Competitive Bidding rate. The Solar Electric Power Association,[13] in its December 2008 report titled "Utility Procurement Study: Solar Electricity in the Utility Market," pp. 62-63[14], tells the story:

> California was arguably the state that most embraced the intent of PURPA to spur a new competitive power industry …
>
> … to accommodate these policy dictates within the economic constraints of PURPA's "avoided cost" determinations … the state adopted a set of four "standard offer" contracts …

[13] The HECO Companies are members of Solar Electric Power Association.

[14] Available at http://www.solarelectricpower.org/docs/Procurement%20Report%20FINAL%20-%2012-16-08.pdf

> Three of the contracts were for short-term energy pricing, although one option allowed for an "as-available capacity" value that proved useful for variable renewable resources, such as wind power. A fourth contract, the **Standard Offer No. 4 (SO4), was meant to represent the costs of long-term capacity and energy**. [emphasis added]
>
> ... After just two years of contract availability, more than 20,000 MW of QF projects had signed SO4 contracts, with **over 10,000 MW worth eventually reaching operations**. [emphasis added]
>
> California's implementation of PURPA was highly controversial and met with strong and continued resistance from utilities ...
>
> By the early 1990s, California's resource procurement regime was **changed to a competitive bidding process**, known as the Biennial Resource Plan Update (BRPU) that pitted non-utility generation against an "identified deferrable resource" of specified technology types that the utilities would otherwise build themselves to meet anticipated load growth. [emphasis added]
>
> This BRPU process proved just as difficult to administer and even more controversial than the standard offer process. In two rounds of bidding that resulted in independent power "winning" bids at prices far lower than the utility issuer default rating costs, some 1,700 MW of contracts were awarded – but **only a single 49 MW gas-fired power plant was ever built**. ... [emphasis added]

10,000 MW under long-term standard offer contract rates, versus 49 MW under Competitive Bidding rates. Competitive Bidding was 200 times ***less*** effective than long-term standard offer contracts in encouraging the development of independent generation in California. The reason is simple and obvious: Competitive Bidding allows the utility to drive the Competitive Bidding rate down to the point where an independent producer has zero incentive to develop a project for generation of utility-distributed electricity.

Competitive Bidding is a ***proven-to-fail*** policy, by a factor of **200**, for encouraging the rapid development of independent large-scale generation of utility-distributed electricity. Yet Competitive Bidding is the primary policy that the HECO/CA FIT would have the Commission employ to achieve the HCEI Agreement goal of moving

"decisively and irreversibly towards indigenously produced renewable energy".[15] The HECO/CA FIT is designed to fail because it perpetuates Competitive Bidding that is proven to fail.

B. The HECO/CA FIT leaves the public exposed to the catastrophic risks and costs of dependence on imported oil for electricity generation.

The HECO/CA FIT specifies speed and size limits and perpetuates proven-to-fail Competitive Bidding. These speed and size limits are designed to discourage the rapid development of large-scale renewable generation energy that otherwise would mitigate the public's exposure to the catastrophic risks and costs of Hawaii's dependence on imported oil for electricity generation.

The scale of such catastrophic risks and costs was estimated by DBEDT in testimony before the Hawaii legislature in 2006.[16] In that testimony, DBEDT estimated that economic impacts in Hawaii of increased oil prices from a drop in world oil production of 8 million barrels per day (about 10% of world oil production) would be a 38% increase in Hawaii electricity prices and a 2.5% drop in Hawaii GDP. Extrapolating from that the economic impacts of a total cessation of oil imports to Hawaii (functionally equivalent to a cessation of world oil production as far as Hawaii goes), one can estimate a 380% increase in Hawaii electricity prices and a 25% drop in Hawaii GDP. Those economic impacts are conservative because, in a scenario of total cessation of oil imports for electricity generation, electricity would be unavailable at any price (except for the electricity produced by renewable generation) and Hawaii GDP would drop precipitously (except for those sectors that use electricity produced by renewable generation).

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[15] HCEI Agreement at 1.

[16] Testimony of Ted Liu, Director of Department of Business Economic Development and Tourism, before the House Committee on Energy and Environmental Protection re HB2308 (February 7, 2006).

The HECO/CA FIT and the IR Responses by the HECO Companies and the Consumer Advocate contain no estimates of the speed and size of renewable generation development that would be achieved by the HECO/CA FIT, other than the hopeful expectation that Competitive Bidding might achieve placement in service of the renewable energy projects listed in the HCEI Agreement. The HECO/CA FIT and these IR Responses contain no estimates of the costs to the public of the HECO/CA FIT. In refusing to make any such estimates, the HECO Companies and the Consumer Advocate are refusing to acknowledge the catastrophic risks and costs to the public of Hawaii's dependence on imported oil for electricity generation, and irresponsibly suggesting that the Commission follow their lead in ignoring such risks and costs.

IV. The HECO/CA FIT justifies the speed and size limits in the HECO/CA FIT with falsehoods and nonsense.

A. The HECO/CA FIT justifies the speed and size limits in the HECO/CA FIT with the falsehood that such limits are justified by "technical challenges" of interconnecting renewable generation.

The HECO/CA FIT justifies the speed and size limits in the HECO/CA FIT with the falsehoods that "the design of the FIT … must take into account … the technical challenges with integrating large amounts of distributed FIT renewable resources on island power systems" and "unique technical challenges of incorporating large amounts of distributed renewable on island power systems … establishes the need for Feed-In Tariff system caps and annual limits."[17] While interconnection at any speed of any renewable generation of any size *may* pose "technical challenges," such interconnection has *nothing* to do with the FIT, which is a *rate* specification, not a *technical* specification. The FIT rate paid for renewable electricity has nothing to do with the "technical

[17] HECO Plan at 32-33 and 36.

challenges" of interconnecting the renewable generation that produces the electricity, because meeting the utility's technical requirements *before* interconnection has nothing to do with the FIT rate paid for renewable electricity *after* interconnection. No renewable generation *of any size* gets interconnected unless the renewable generation first meets the utility's own technical requirements that exist separate and apart from the FIT rates.

The truth is that speed and size limits on renewable generation eligible for FIT rates are completely unnecessary for addressing the "technical challenges" of interconnection that are addressed specifically and appropriately by the utility's own technical requirements for interconnection. Speed and size limits on eligibility for FIT rates slows the speed, shrinks the size and increases the cost to the public of renewable generation development, but adds nothing to the utility's right to insist that renewable generation meet the utility's own technical requirements for interconnection before interconnection occurs.

Nowhere does the HECO/CA FIT prove that "technical challenges ... establishes the need for Feed-In Tariff system caps and annual limits," or that "the design of the FIT ... must take into account ... the technical challenges with integrating large amounts of distributed FIT renewable resources on island power systems."[18] The HECO/CA FIT

[18] *See* note 17, *supra*. The HECO Plan, at 36-54, devotes 19 pages describing the technical challenges of interconnection, but contains *not one sentence* showing what these technical challenges have to do with FIT *rates*. Evidence showing that technical challenges establish the need for speed and size limits on the amount of renewable generation eligible for FIT rates would include: evidence in any jurisdiction that has adopted FIT rates without speed and size limits that lack of speed and size limits has created technical challenges for interconnection of renewable generation economically motivated by FIT rates, or that technical challenges of interconnection have necessitated speed and size limits on the development of renewable generation economically motivated by FIT rates; evidence that FIT rates themselves create technical interconnection challenges that would not exist without the FIT rates; evidence in any jurisdiction that has adopted FIT rates that lack of speed and size limits on availability of FIT rates has created "technical challenges" that were not addressed by those jurisdictions' own technical requirements for interconnection. The HECO/CA FIT presents no such evidence because it is not true that technical challenges of interconnection require speed and size limits on renewable generation eligible for FIT rates. Nowhere does the HECO/CA FIT establish with evidence that "technical challenges" of interconnection require speed and size limits on the amount of renewable generation eligible for FIT rates.

provides no evidence to support these statements and cannot prove these statements because they are not true.

The truth is that design of a FIT does not need to take into account the *technical* challenges of interconnecting large amounts of renewable generation, but does need to take into account the *economic* challenges of interconnecting large amounts of *intermittent* renewable generation. It does not make *economic* sense to interconnect large amounts of wind and solar generation to the grid if the electricity produced by such intermittent generation is redundant to the firm electricity that the utility needs to maintain reliability. [19]

The HECO/CA FIT avoids this truth – of *economic* limits on the amount of intermittent wind and solar renewable generation that may be interconnected with the grid – by conflating it with the falsehood that "technical challenges" – such as "system stability issues" and "system reliability" -- justify and necessitate speed and size limits on the amount of renewable generation that may be interconnected with the grid.[20] The HECO/CA FIT conflates truth with falsehood to falsely imply that grid penetration limits on intermittent renewable generation are justified by technical "stability" and "reliability" challenges, rather than economic concerns.

The HECO/CA FIT further avoids this truth – that any limits on grid penetration of intermittent renewable generation are economic, not technical – by putting off the determination of these grid penetration limits to an indefinite time in the future under a

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[19] *See* notes 44 and 45, *infra*, and accompanying text citing technical literature relating to economic justification for grid penetration limits for intermittent wind and solar generation.

[20] *See* HECO Plan at 29:

> There is a need to establish high level cumulative system targets for intermittent generation by island to avoid system stability issues and reduced system reliability. The cumulative system capacity targets should include all variable generation including independent power producers, net energy metered systems, and FIT systems that will contribute to island system stability issues.

utility-controlled Clean Energy Scenario Planning (CESP) process[21] that, like the now-terminated Integrated Resource Planning (IRP) process, is likely to facilitate opaque decision-making by the utility.

The HECO Companies further avoided acknowledgment of this truth in their responses to the Commission's Information Request PUC-IR-1, in which the HECO Companies essentially refused to apply their knowledge and expertise to estimate such economic limits on grid penetration. The HECO Companies would have the Commission believe that economic limits on wind and solar grid penetration cannot be estimated, even though published literature of others' estimates is easily found.[22] The HECO Companies' response to the Commission's PUC-IR-1 suggests that the HECO Companies did not even bother to search for responsive information.

B. The HECO/CA FIT justifies the speed and size limits in the HECO/CA FIT with the falsehood that technologies like biomass "do not have a high degree of demonstrated market desire and development experience in Hawaii."

The HECO/CA FIT justifies the speed and size limits in the HECO/CA FIT with the falsehood that technologies like biomass "do not have a high degree of demonstrated market desire and development experience in Hawaii."[23] Biomass technologies like bagasse have a 100-year history of "demonstrated market desire and development experience in Hawaii."

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[21] *See* HECO Plan at 29-30:

> ... The high level cumulative target settings by island will be incorporated and regularly updated in the CESP process. The annual FIT quantity targets will take this into account when the data becomes available. ...

[22] *See* notes 44 and 45 and accompanying text relating to economic grid penetration limits for wind and solar.

[23] HECO Proposal at 7.

C. The other justifications for the speed and size limits in the HECO/CA FIT are nonsense.

The HECO/CA FIT justifies the speed and size limits in the HECO/CA FIT with:

(1) "complex environmental and land use permitting"[24]

(2) "lengthy interconnection studies or the need for significant interconnection requirements"[25] and

(3) "complex financial accounting"[26]

In other words, the HECO/CA FIT is saying that the Commission should adopt the designed-to-fail HECO/CA FIT, containing speed and size limits designed to discourage rapid development of large-scale renewable generation and impose high costs on the public, because:

(1) a project developer may encounter "complex environmental and land use permitting"

(2) a project developer may encounter "lengthy interconnection studies or the need for significant interconnection requirements"

(3) the utility may have to do some "complex financial accounting."

A project developer may encounter complex environmental and land use permitting whether or not the renewable generation project is eligible for the FIT rate. A feed-in tariff is a rate specification, not a permitting specification. That a project developer may encounter complex environmental and land use permitting is no reason to adopt a fake feed-in tariff, like the HECO/CA FIT, containing speed and size limits designed to discourage rapid development of large-scale renewable generation and impose high costs on the public.

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[24] HECO/CA Proposal at 5.
[25] *Id.*
[26] *Id.*

A project developer may encounter lengthy interconnection studies or the need for significant interconnection requirements whether or not the renewable generation project is eligible for the FIT rate. A feed-in tariff is a rate specification, not an interconnection specification. That a project developer may encounter lengthy interconnection studies or the need for significant interconnection requirements is no reason to adopt a fake feed-in tariff, like the HECO/CA FIT, containing speed and size limits designed to discourage rapid development of large-scale renewable generation and impose high costs on the public.

The utility may encounter complex financial accounting whether or not a renewable generation project is eligible for the FIT rate. A feed-in tariff is a rate specification, not an accounting specification. That the utility may have to spend some time doing some complex financial accounting is no reason to adopt a fake feed-in tariff, like the HECO/CA FIT, containing speed and size limits designed to discourage rapid development of large-scale renewable generation and impose high costs on the public.

D. What is the real justification for the speed and size limits in the HECO/CA FIT?

If the justifications offered for the speed and size limits in the HECO/CA FIT are falsehoods or nonsense, what is the real justification for those speed and size limits? Rapid development of large-scale renewable generation by independent generators competes with and substitutes for utility-owned generation, and reduces the utility's monopoly share of the Hawaii market for electric power generation.[27] Although the utility's earnings on average would remain unchanged by such substitution because the

[27] As of the end of 2005, total utility-owned rated nameplate generating capacity in Hawaii was 1795.3 MW out of total rated nameplate generating capacity of 2573.2 MW. United States Energy Information Administration *2005 Electric Power Annual* (October 4, 2006)

utility would recover from ratepayers the entire costs of such substitution[28], increased competition and reduced market share means increased risk to the utility and increased variability in the utility's earnings.[29] The issue then is what to do about the variability in utility earnings that is an inevitable result of rapid development of large-scale renewable generation.

The utility's solution to this issue is to avoid earnings variability by avoiding rapid development of large-scale renewable generation. The HECO/CA FIT contains speed and size limits to perpetuate proven-to-fail Competitive Bidding and avoid rapid development of large-scale renewable generation because avoiding such development avoids the earnings variability caused by such development. That is the real justification for the speed and size limits in the HECO/CA FIT.

Avoiding rapid development of large-scale renewable generation, to avoid earnings variability for the utility, leaves the public exposed to the catastrophic risks and costs of perpetual dependence on imported oil for electricity generation, unmitigated by rapid development of large-scale renewable generation. The HECO/CA FIT solves the problem of utility earnings variability by leaving the public exposed to these catastrophic risks and costs.

The best solution to this problem is giving the utility the opportunity to increase its earnings, to compensate the utility for the increased variability of its earnings, by giving the utility the same opportunity, to develop large-scale renewable generation and sell renewable electricity (to itself) at a favorable FIT rate, that independent developers have under a true feed-in tariff, like Intervenors' FIT. A true feed-in tariff, like

[28] HCEI Agreement at 16.

Intervenors' FIT, offers a playing field for rapid development of large-scale renewable generation development that is transparent and fair for all producers, whether that producer is the utility or an independent. Allowing the utility to develop renewable generation eligible for a true FIT aligns the financial interests of the utility with rapid development of large-scale renewable generation at low cost to the public, instead of being opposed to such development. If the utility fails to avail itself of the opportunity to increase its earnings through development of renewable generation eligible for the favorable FIT rate, then the financial effects of any variability in the utility's earnings rightly should fall on the utility's shareholders and not the ratepaying public or the public at large.

Worse solutions, from the public's point of view, to the problem of utility earnings variability are:

- establishing a designed-to-fail HECO/CA FIT, that perpetuates proven-to-fail Competitive Bidding, to avoid and discourage the rapid development of large-scale renewable generation and leave the public exposed to the catastrophic risks and costs of dependence on imported oil for electricity generation
- establishing a PV Host Program that gives the utilities a tilted playing field in which they can exploit their monopoly power over transmission & distribution to destroy competition from independent producers in the market for photovoltaic generation, and discouraging rapid development of large-scale renewable generation at low cost to the public

[29] The HECO/CA FIT refers to such earnings variability in terms of its potential effect on the HECO Companies' credit rating. HECO Plan at 30-31. The HCEI Agreement refers to such earnings variability in terms of a "financially sound electric utility." HCEI Agreement at 1.

- bribing the utilities with addition to the rate base of 10% of the utility's expenditures under FIT contracts, imposing costs on the public that augment the utility's profits, but that do nothing to alter the utility's financial interest in avoiding and discouraging rapid development of large-scale renewable generation.

VI. Under the Intervenors' FIT, the utility will be obliged to make grid improvements necessary for rapid development of large-scale renewable generation and will want to make such improvements.

The HECO/CA FIT perpetuates the utility's ability to discourage rapid development of large-scale renewable generation through delay of implementation and expenditures for grid improvements necessary for such development.[30] Just because the utility may *not want* – for anticompetitive reasons discussed in Section V, *supra* – to make grid improvements necessary for rapid development of large-scale renewable generation, does not mean that the utility *cannot* make such improvements. The truth is that the utility *can* make such improvements, and that, under the proven-to-succeed Intervenors' FIT, the utility will be *obliged* to make such improvements and will *want* to make such improvements.

Under the proven-to-succeed Intervenors' FIT, the utility will be obliged to make such grid improvements because, under the Intervenors' FIT, the utility will be obliged to interconnect renewable generation, provided (1) the renewable generation meets the

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[30] The HECO/CA FIT assumes that the utility's discretion and ability to delay implementation and expenditures for grid improvements will remain unchanged:

> Consistent with the provisions of the HCEI Agreement, the HECO Companies may choose to implement modifications on the utility system side of the point of interconnection to facilitate distributed energy resource utilization beyond an individual FIT installation, the costs of which will be recovered through the Clean Energy Infrastructure Surcharge and later placed in rate base in the course of the next rate case proceeding.

HECO Plan at 32. The HECO/CA FIT also omits payment for grid improvements from the policy and design objectives of the HECO/CA FIT. HECO Plan at 8-9.

utility's technical requirements for interconnection[31], and (2) the renewable generation pays the utility for the costs[32] of such improvements.[33]

Under the proven-to-succeed Intervenors' FIT, the utility will *want* to make such grid improvements because of the utility's obligation, under the Intervenors' FIT, to pay for all renewable electricity delivered to the utility, or that would be delivered to the utility but for the utility's curtailment of the generation or delivery of such electricity. To the extent that the utility is obliged to pay for renewable electricity that would have been delivered but for curtailment by the utility, the utility may be incurring costs, for achieving grid stability and reliability benefits, that are high compared the costs of grid improvements for achieving the same benefits. Under the Intervenors' FIT, the potentially high cost of curtailing gives the utility an incentive to make grid improvements that will cost the utility less than the cost of curtailing to achieve such benefits, so that the utility wants to make these grid improvements.

In adopting a true feed-in tariff, like the proven-to-succeed Intervenors' FIT, the Commission would be making a policy decision that rapid development of large-scale renewable generation will pay for and drive the grid improvements needed to achieve such development, and that such development will not have to wait for grid improvements paid for by the utility in the discretion of the utility.

VII. The Commission Should Adopt Intervenors' FIT That Uses a First Ready-to-Interconnect, First-Served Queuing Procedure.

The Intervenors' FIT proposes a first-ready-to-interconnect, first-served queuing procedure, for wind and solar projects subject to the wind and solar grid penetration

[31] *See* the HECO Companies' Tariff Rule 14.H.
[32] *See* Decision & Order No. 22248 in the Distributed Generation Investigative Docket No. 03-0371.
[33] In addition, the utility would be obliged to interconnect intermittent wind or solar generation only if the generation does not exceed the grid penetration limits specified in Intervenors' FIT.

limits proposed in the Intervenors' FIT, based on the first ready-to-interconnect, first-served interconnection queuing procedure adopted by the Midwest ISO.[34] In contrast, the HECO/CA FIT proposes a first come, first-served queuing procedure[35] for each technology type subject to the annual and size limits determined by the utility and contained in the HECO/CA FIT, and proposes a set of fixed 12-month or 24-month project operation deadlines, depending on technology type and project size, under which the project loses its place in the queue if it does not achieve operation by the deadline.[36]

The queuing procedure devised by the HECO/CA FIT – creating multiple queues for each technology type by annual limit and size limit, randomly queuing viable projects behind non-viable projects for up to 24 or more months based on date of application, and then dismissing viable projects that either fail to meet an arbitrary 12-month or 24-month deadline or fail to pay the additional fee to stay behind the non-viable projects – is the kind of procedure that one would propose if one wanted to discourage project development by creating maximum uncertainty for the project developer.

VIII. The Commission Should Not Eliminate Net Energy Metering

A. The HCEI Agreement misrepresents the understanding of the Department of Business Economic Development & Tourism (DBEDT) regarding NEM

At the Technical/Settlement Meeting held on March 18, 2009, in this docket, Ms. Estrella Seese, who apparently represented the State of Hawaii DBEDT in the negotiation of the HCEI Agreement, told those present that, in negotiating the HCEI Agreement, that the parties agreed to eliminate the system size and aggregate caps on NEM, not to eliminate NEM itself, and that the parties agreed that a customer-generator should be

[34] *See* note 40 and accompanying text relating to the interconnection queuing procedure adopted by the Midwest ISO.
[35] HECO Plan at 33.

compensated at the FIT rate for its net production of energy supplied to the utility in excess of the customer-generator's net consumption of energy supplied by the utility. Assuming the truth of what Ms. Seese said, the HCEI Agreement appears to misrepresent the understanding of DBEDT regarding NEM.

B. The Commission Has No Authority to Eliminate NEM.

In giving the Commission authority to "modify" the total rated generating capacity produced by eligible customer-generators, there is nothing in the statute (HRS § 269-102(a)) or in the legislative history of Act 150, 2008 Session Laws of Hawaii, showing that the legislature intended to give Commission authority to eliminate NEM by modifying the NEM total capacity limit down to "0".

Referring to this authority, the Consumer Advocate testified:

> The language included in the measure that provides the Commission with the authority to "modify" (instead of merely "increase") the total rated generating capacity and customer-generator size will be helpful in the development and implementation of the utilities' net-energy metering programs. The electric utilities and other stakeholders may be less apprehensive about implementing larger increases if the Commission is authorized to also decrease the amounts in certain circumstances, if some harm, previously unforeseen by the Commission and stakeholders, occurred.[37]

C. Eliminating NEM would discourage rapid development of small-scale renewable customer-generation that has no cost to the public.

The HECO/CA FIT justifies elimination of NEM with the falsehood that an "appropriately priced FIT is preferable" to NEM because "NEM customers, by receiving credit at the full retail rate, essentially receive a subsidy from all other customers."[38] The

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[36] HECO Plan at 34.

[37] Testimony of Catherine Awakuni, Executive Director of Division of Consumer Advocacy to the Senate Committee on Commerce, Consumer Protection and Affordable Housing re HB 2550, HD2, SD1(March 28, 2008)

[38] HECO Plan at 11.

truth is that, when the distributed generation benefits to the utility and its ratepayers of net energy metered renewable energy (valued at 7¢ per kWh based on studies performed for PG&E and Austin Energy)[39] are added to the utility's avoided cost (about 10¢ per kWh for HECO as reported on its Schedule Q for the 2nd quarter of 2007) from the purchase of such renewable energy, the true economic value of net energy metered renewable energy (about 17¢ per kWh) to the utility and its ratepayers is about equal to the effective retail rate (about 17¢ per kWh for a HECO Schedule G customer as of April 2007) at which the utility is obliged to value such electricity. Thus, NEM is not a subsidy of NEM customer by all other customers, and has no cost to the ratepaying public.

[39] Distributed generation benefit is calculated by adding avoided grid losses of $21/kWy, reactive power savings of $8/kWy, transmission capacity benefits of $44/kWy, transformer deferral benefits of $115/kWy and reliability benefits of $205/kWy, as measured in 1992 for the PG&E Substation in Kerman, California and summarized in *Small is Profitable* by A.B. Lovins, E. K. Datta, T. Feiler, K. R. Rabago, J.N. Swisher, A. Lehmann and K. Wicker (Rocky Mountain Institute 2002), p. 236, converting said benefits to cents per kilowatt-hour and increasing the resulting benefit by an inflation factor of 2.9% per annum equal to average Consumer Price Index inflation rate during period 1990-2005.

A more recent study prepared for Austin Energy concluded that generating capacity, environmental, transmission & distribution deferral and loss savings benefits from photovoltaic distributed generation were worth about 4¢ per kilowatt-hour to the utility, not including reliability benefits. T.E. Hoff, R. Perez, G. Braun, M. Kuhn and B. Norris, *The Value of Distributed Photovoltaics to Austin Energy and the City of Austin* (Clean Power Research LLC 2006) p. 69.

IX. Summary

Here is a side-by-side comparison of the Intervenors' FIT and the HECO/CA FIT:

Intervenors' FIT Proven to Succeed		HECO/CA FIT Designed to Fail	
Rapid development of large-scale renewable generation at low cost to the public		Slow development of small-scale renewable generation at high cost to the public	
No speed and size limits	→ rapid, large-scale & proven to succeed	Speed and size limits	→ slow, small-scale & designed to fail
Replaces Competitive Bidding	→ rapid, large-scale, low cost to public & proven to succeed	Perpetuates Competitive Bidding	→ slow, small-scale, high cost to public & proven to fail
Transparent market selection of projects	→ proven to succeed	Opaque utility selection of projects	→ proven to fail
Renewable generation pays for grid improvements	→ rapid, large-scale & low cost to public	Renewable generation waits for utility to pay for grid improvements	→ slow, small-scale & high cost to public
Utility obligation to pay for curtailed production	→ rapid, large-scale, low cost to public	No utility obligation to pay for curtailed production	→ slow, small-scale & high cost to public
Acknowledge truth that economics justify grid penetration limits for wind & solar	→ rapid, large-scale & low cost to public	Perpetuate falsehood that technical challenges justify speed & size limits	→ slow, small-scale & high cost to public
Retains net metering	→ rapid, small-scale, no cost to public & proven to succeed	Eliminates net metering	→ slow, small-scale, high cost to public & designed to fail
First ready-to-interconnect, first-served	→ rapid	First come, first-served	→ slow
Reduces Hawaii's oil dependence		Perpetuates Hawaii oil dependence	
Mitigates catastrophic costs of Hawaii's oil dependence		Ignores catastrophic costs of Hawaii's oil dependence	
Does something to achieve HCEA goals		Does nothing to achieve HCEA goals	

FINAL STATEMENT OF POSITION ON ISSUES

Purpose of Project-Based Feed-in Tariffs (PBFiTs)

1. What, if any, purpose do PBFiTs play in meeting Hawaii's clean energy and energy independence goals, given Hawaii's existing renewable energy purchase requirements by utilities?

   Statement of Position: PBFiTs -- unlimited by annual caps, size caps and expenditure caps -- are critically necessary for meeting Hawaii's clean energy and independence goals at minimum cost to the public. PBFiTs encourage rapid development of renewable energy (RE) projects by creating the customer certainty and revenue certainty that project developers need to obtain financing for such development.

2. What are the potential benefits and adverse consequences of PBFiTs for the utilities, ratepayers and the state of Hawaii?

   Statement of Position: The benefits of PBFiTs for utilities, ratepayers and the state of Hawaii are the achievement of energy security and independence commensurate with 70% or more of Hawaii's electricity generated from renewable sources found in Hawaii, at minimal additional cost to utilities, ratepayers and the state of Hawaii. Adverse consequences of PBFiTs to utilities, ratepayers and the state of Hawaii are reductions in the speed, diminishment of the size and increase in the cost to the public of renewable electricity development in Hawaii if PBFiTs are limited by annual caps, size caps or expenditure caps.

3. Why is or is not the PBFiT the superior methodology to meet Hawaii's clean energy and energy independence goals?

   Statement of Position: Project-based FiTs are superior to the Competitive Bidding Framework and penalty-based renewable portfolio standard (RPS) quotas for the development of utility-distributed RE generation because:

   (1) price and revenue certainty of FiTs encourage the rapid development of RE projects;

   (2) customer certainty of FiTs encourage the rapid development of RE projects;

   (3) unlike RPS, the incentive effect of FiTs encouraging the rapid development of RE generation does not expire when a RE production quota is achieved by the utility;

   (4) making utility-developed RE projects eligible for FiTs encourages rapid RE development;

(5) the subsidy cost to ratepayers of FiTs is substantially less than the subsidy cost to ratepayers of renewable energy certificates (RECs) under RPS;

(6) FiTs encourage diversity of renewable energy sources and rapid RE development, lowering the risk and therefore, the cost to the public of RE development;

(7) FiTs are transparent, unlike utility decision-making under Competitive Bidding and RPS, lowering risk and costs to the public of RE development; and

(8) FiT is a performance incentive, encouraging maximum output per dollar of subsidy cost to the ratepayer and thus lowering the subsidy cost to the ratepayer.

Legal Issues

4. What, if any, modifications are prudent or necessary to existing federal or state laws, rules, regulations or other requirements to remove any barriers or to facilitate the implementation of a feed-in tariff not based on avoided costs?

Statement of Position: The following modifications are prudent or necessary to facilitate the implementation of a feed-in tariff not based on avoided costs:

(1) The avoided cost ceiling under HRS section 269-27.2 should be changed back to an avoided cost floor, so that HRS section 269-27.2 does not prohibit payment of a feed-in tariff rate in excess of avoided cost;

(2) To avoid unnecessary imposition of costs on the taxpaying public, a renewable energy generator that obtains a feed-in tariff rate should not be able to claim the renewable energy technology income tax credit under HRS section 235-12.5, or the capital goods excise tax credit under HRS section 235-110.7;

(3) To avoid unnecessary imposition of costs on the ratepaying public, a renewable energy generator that obtains a feed-in tariff rate should not be able to obtain net energy metering under the Company's Rule 18; and

(4) To avoid unnecessary imposition of costs on the ratepaying public, a renewable energy generator that obtains a feed-in tariff rate should not be able to obtain photovoltaic rebates under a program established by the commission pursuant to Act 151, Session Laws Hawaii 2008.

5. What evidence must the commission consider in establishing a feed-in tariff and has that evidence been presented in this investigation?

Statement of Position: The commission must consider evidence showing the effectiveness in other nations of feed-in tariffs – unlimited by annual caps, size caps and expenditure caps limits -- in encouraging the rapid development of utility-distributed renewable electricity generation at minimal cost to the public. The commission must consider evidence showing investor motivation to invest in the development of RE projects based on the specified FiT rates for the technology and size of the RE projects.

Role of Other Methodologies

6. What role do other methodologies for the utility to acquire renewable energy play with and without a PBFiT, including but not limited to power purchase contracts, competitive bidding, avoided cost offerings and net energy metering?

Statement of Position: A Proposal for Feed-in Tariff submitted herewith is intended to encourage rapid development of renewable electricity generation for utility distribution.

The Proposal for Feed-in Tariff submitted herewith is intended to replace the Competitive Bidding Framework for renewable electricity generation that is larger than 5 MW on the island of Oahu and larger than 2.7 MW on the islands of Maui and Hawaii.

The Proposal for Feed-in Tariff submitted herewith is intended to replace the "de-linked" rate (with avoided cost ceiling) provided by HRS section 269-27.2 for renewable energy generation that is smaller than 5 MW on the island of Oahu and smaller than 2.7 MW on the islands of Maui and Hawaii, and is intended to replace the Schedule Q (avoided cost) rate for renewable electricity generation that is smaller than 100 kW.

The Proposal for Feed-in Tariff submitted herewith is **not** intended to replace net energy metering for self-generation of renewable electricity.

Best Design for a PBFiT or alternative method

7. What is the best design, including the cost basis, for PBFiTs or other alternative feed-in tariffs to accelerate and increase the development of Hawaii's renewable energy resources and their integration in the utility system?

Statement of Position: The Proposal for Feed-in Tariff submitted herewith is the best design for a PBFiT to accelerate and increase the development of Hawaii's renewable energy resources and their integration in the utility system, because a feed-in tariff of this design has proven effective in Germany for achieving 14% renewable electricity generation production in 7 years at a cost to German ratepayers of about $.014/kWh. The Proposal for Feed-in Tariff is estimated to

cost ratepayers approximately $.04/kWh to achieve 40% renewable electricity production in Hawaii, per the calculation shown in response to Issue No. 9 below.

Eligibility Requirements

8. What renewable energy projects should be eligible for which renewable electricity purchase methods or individual tariffs and when?

Statement of Position: Renewable energy projects using the following commercially-proven technology types should be eligible for technology-specific PBFiTs, payable over 20 year PBFiT contract terms:

Biomass or biogas
Geothermal energy
Landfill gas or sewage treatment plant gas
Hydropower
Photovoltaic
Concentrating solar
Onshore wind
Offshore wind

PBFiTs for other technology types should be deferred until they are commercially proven (e.g., ocean thermal, liquid biofuels, hydrogen).

Renewable energy projects developed by unregulated subsidiaries of the utilities should be permitted to qualify for the FiT because the utilities should be encouraged to deploy their financial and technological resources to accelerate the speed, enlarge the scale and decrease the cost to the public of renewable electricity development in the state of Hawaii. Allowing utility-developed projects to qualify for the FiT aligns the utilities' financial interests with rapid large-scale renewable energy development at low cost to the public.

Renewable energy projects should be eligible for FiT on a "first ready, first to interconnect" basis, modeled after the interconnection queue management procedures of the Midwest ISO[40], including:

[40] *See* Midwest Independent Transmission System Operator ("Midwest ISO"), Generator Interconnection Process Tariff (August 25, 2008) http://www.midwestmarket.org/publish/Document/25f0a7_11c1022c619_-7d600a48324a/Attachment%20X%20GIP.pdf?action=download&_property=Attachment; Midwest ISO, Business Practices Manual: Generator Interconnection (Manual No. 15, TP-BPM-004-r2, January 6, 200p) http://www.midwestmarket.org/publish/Document/45e84c_11cdc615aa1_-7e010a48324a; Working group for Investment in Reliable & Economic electric Systems (WIRES), Integrating Locationally-Constrained Resources Into Transmission Systems: A Survey of U.S. Practices (October 2008) http://www.wiresgroup.com/images/WIRES_Report_LCR.pdf ; 124 FERC ¶ 61,183, Midwest Independent Transmission System Operator, Inc., Docket No. ER08-1169-000, Order Conditionally Accepting Tariff Revisions and Addressing Queue Reform (August 25, 2008) http://elibrary.ferc.gov/idmws/doc_info.asp?document_id=13641108

(1) a pre-queue system planning and analysis phase, possibly including an "open season" for submission of interconnection requests (modeled after the California ISO procedure)

(2) a definitive planning phase in which a system impact restudy is performed, if necessary, as well as a facilities study; the system impact restudy permits interconnection requests to be routed to a "fast lane" to allow projects in unconstrained areas to proceed without delay

(3) the fee to enter the definitive planning phase is approximately double the expected actual cost of the restudy, with the excess used to cover the facilities study and costs incurred to re-study lower-queued projects if the generator drops out; unused balances are returned to the customer; study deposits are $30,000 for projects between 20 and 50 MW and $60,000 for projects larger than 50 MW

(4) entering into the definitive planning phase requires technical data and meeting milestones; required technical data are 1) a detailed stability model, 2) a definitive point of interconnection, 3) a one-line diagram showing ratings and impedance information for associated electrical equipment, 4) the definitive amount of capacity of the project, 5) recertification of site control, or, if the project has provided a $100,000 deposit in lieu of showing site control, the deposit becomes nonrefundable 10 business days after the start of the planning phase, and 6) any two of four other items; the four other items are i) documentation of an application for state or federal permits and a showing that the application is proceeding, ii) approval of the project by the commission, iii) approval from an independent board of directors of the applicant or a similar showing of organizational approval, or iv) security equal to the nameplate capacity times the rate for one month of drive-out point-to-point transmission service

(5) before the utility will start a facilities study, the generator must show that it has achieved one of the following additional milestones: 1) security for the cost of network upgrades as determined in the system planning and analysis review, 2) execution of a power sale agreement or an attestation that the project is included in a state resource adequacy plan or evidence that the generator will qualify as a designated network resource or 3) a demonstration that the turbines have been ordered

(6) permit suspension by the customer of the effectiveness of an executed interconnection agreement and of the utility's construction or installation of interconnection facilities or network upgrades only in cases of force majeure.

Analysis of the cost to consumers and appropriateness of caps

9. What is the cost to consumers and others of the proposed feed-in tariffs?

Statement of Position: The net ratepayer subsidy cost of a Hawaii FiT, assuming the utility meets the RPS goals set forth in the Agreement (40% by 2030), can be estimated as follows. In the white paper, *Feed-in Tariff Case Studies*, prepared for the U.S. Department of Energy and the State of Hawaii in support of the Hawaii Clean Energy Initiative[41], the author reports that the increased cost, as of 2008, to German ratepayers as a result of the German FiT has been €.007 (or US $.01) per kWh.[42] A study by the Federal Republic of Germany Ministry for the Environment[43] found that the increased cost for households was about €.01/kWh as of 2007, or about $1.40/kWh. As of 2008, Germany had achieved approximately 14% of kWh from renewable sources, of which approximately ¾ came from wind and ¼ came from solar. If Hawaii establishes a feed-in tariff having the same FiT rates as the German FiT over the same 20 year term, and if the Hawaii utility meets the 40% by 2030 goal using wind and solar in the same proportion as Germany, it may be estimated that the increased cost to Hawaii ratepayers as a result of the Hawaii FiT would be about $.014/kWh multiplied by 40% divided by 14%, or about $.04/kWh.

10. Should the commission impose caps based upon these financial effects, technical limitations or other reasons on the total amount purchased through any mechanism or tariff?

Statement of Position: The commission should not impose any caps on the total amount of renewable electricity purchased by the utility through a feed-in tariff, except that:

(1) purchase of renewable electricity generated from wind should be limited to purchases of electricity from wind generating facilities (onshore and offshore) having aggregate island-wide capacity that is no more than 25% of peak demand for such island,[44] and

(2) purchase of renewable electricity generated from solar radiation should be limited to purchases of electricity from photovoltaic and concentrating solar

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[41] Douglas Hinrichs, *Feed-in Tariff Case Studies: A White Paper in Support of the Hawaii Clean Energy Initiative* (Sentech, Inc. September 2008).

[42] Marcus Maedl, "The German FIT for Renewable Energy – A Bargain!" *Renewable Energy World* (April 14, 2008) http://www.renewableenergyworld.com/rea/news/reinsider/story?id=52126

[43] Federal Republic of Germany Ministry for the Environment, Nature Conservation and Nuclear Safety, *Electricity from Renewable Energy Sources: What does it cost us?* (March 2008).

[44] *See* B. Parsons, M. Milligan, J.C. Smith, E. DeMeo, B. Oakleaf, K. Wolf, M. Schuerger, R. Zavadil, M. Ahlstrom and D. Yen Nakafuji, "Grid Impacts of Wind Power Variability: Recent Assessments from a Variety of Utilities in the United States," National Renewable Energy Laboratory Conference Paper NREL/CP-500-39955 (July 2006) http://www.uwig.org/Ewec06gridpaper.pdf ; J.C. Smith, B. Parsons, T. Acker, M. Milligan, R. Zavadi, M. Schuerger and E. DeMeo, "Best Practices in Grid Integration of Variable Wind Power: Summary of Recent US Case Study Results and Mitigation Measures," presented at Europe Wind Energy Conference '07, Milan Italy (May 2007) http://www.wapa.gov/UGP/PowerMarketing/WindHydro/EWEC07paper.pdf.

power facilities having aggregate island-wide capacity that is no more than 20% of peak demand for such island.[45]

Island-wide grid penetration caps for intermittent RE are justified because it does not make sense to oblige the utility and ratepayers to pay for RE from intermittent sources (solar and wind) if such RE displaces no fixed generation from imported fuels because of the need to maintain such fixed generation to maintain present-day levels of grid reliability.

Annual caps, production caps (curtailment), size caps and expenditure caps on FiT-incentivized renewable electricity development would:

(1) increase the cost to the public of renewable electricity development by slowing the speed of renewable electricity development;

(2) increase the cost to the public of renewable electricity development by decreasing the size and scale of renewable electricity development;

(3) increase the cost to the public of renewable electricity development by increasing the price, revenue and customer risk and uncertainty of renewable energy project development;

(4) increase the cost to the public of any interruption in the delivery of oil to Hawaii by slowing the speed, limiting the size and increasing the cost to the public of renewable energy development in Hawaii; and

(5) increase the cost to the public of any interruption in the delivery of oil to Hawaii by perpetuating and prolonging Hawaii's dependence on imported oil for electric power generation.

Procedural Issues

11. What process should the commission implement for evaluating, determining and updating renewable energy purchased power mechanisms or tariffs?

Statement of Position: The commission should evaluate, determine and update, if necessary, the PBFiT schedule at intervals of every 3 years, to determine whether adjustments are appropriate based on economic, technological and market changes during the interval preceding the evaluation.

[45] *See* P. Denholm and R.Margolis, "Very Large-Scale Deployment of Grid-Connected Solar Photovoltaics in the United States: Challenges and Opportunities," National Renewal Energy Laboratory Conference Paper NREL/CP-620-39683 (April 2006) http://www.nrel.gov/pv/pdfs/39683.pdf; Paul Denholm and Robert M. Margolis, "Evaluating the limits of solar photovoltaics (PV) in traditional electric power systems," 35 Energy Policy 4424-4433 (Elsevier, September 2007).

The most important factor in the commission's evaluation, determination and updating of the PBFiT schedule should be the amounts of RE generating capacity (in MW) called forth by the FiT during the interval preceding the evaluation. Relatively small additions to generating capacity from a particular RE technology during the interval would be a signal that the FiT rate was set too low for that technology and might be increased for the next interval. Relatively enormous additions to generating capacity from a particular RE technology during the interval would indicate that the FiT rate was set too high for that technology and might be decreased for the next interval.

12. What are the administrative impacts to the commission and the parties of the proposed approach?

Statement of Position: The administrative impact to the commission and the Consumer Advocate of the FiT is staff time required to perform the review and approval of FiT agreements, and the triannual evaluation, determination and updating of FiT rates and categories.

The administrative impact to the utility parties of the FiT is the need to staff up with electrical engineers to engineer the interconnection of RE projects on a project-by-project basis.

The administrative impact to the renewable energy industry of the FiT is the reduction of administrative costs on a per-project basis because of the reduction of price, revenue and customer uncertainty and the reduction of delays in RE project development.

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DATED: Honolulu, Hawaii, March 30, 2009

Erik Kvam
Chief Executive Officer
Zero Emissions Leasing LLC

PROPOSAL FOR FEED-IN TARIFF

SCHEDULE FIT

Feed-in Tariff – Purchases from Renewable Energy Generating Facilities

Definitions:

For the purposes of this Schedule:

(1) "Biogas" means a gaseous fuel produced by anaerobic decomposition of organic matter.

(2) "Biomass" means aquatic or terrestrial plant material, vegetation, or agricultural waste, originating in the State of Hawaii, used as a fuel or energy source.

(3) "Company" means Hawaiian Electric Company, Inc.

(4) "Concentrating Solar Power Facility" means a Renewable Energy Generating Facility that generates electricity by concentrating Solar Radiation to heat a working fluid that drives a generator.

(5) "Electrical Capacity" means the installed maximum potential alternating-current electricity generating capacity, in kilowatts, of a Renewable Energy Generating Facility.

(6) "Hybrid Facility" means a Renewable Energy Generating Facility that generates electricity from two or more Renewable Energy Sources.

(7) "Hydropower" means the energy of moving water, including wave energy, ocean thermal energy conversion, and tidal energy.

(8) "Non-Wood-Burning Generating Facility" means a Renewable Energy Generating Facility that generates electricity from Biomass and that is not a Wood-Burning Generating Facility.

(9) "Offshore Wind Generating Facility" means a Wind Generating Facility that is located in an ocean water depth of at least 20 meters.

(10) "Onshore Wind Generating Facility" means any Wind Generating Facility that is not an Offshore Wind Generating Facility.

(11) "Photovoltaic Generating Facility" means a Renewable Energy Generating Facility that generates electricity from unconcentrated Solar Radiation.

(12) "Renewable Energy" means electricity generated by a Renewable Energy Generating Facility from a Renewable Energy Source.

(13) "Renewable Energy Generating Facility" means any identifiable facility, plant, installation, project, equipment, apparatus, or the like, located in the State of Hawaii, placed in service after the effective date of this Schedule, and that generates Renewable Energy from a Renewable Energy Source.

(14) "Renewable Energy Generator" means any person that owns, controls, operates, manages, or uses a Renewable Energy Generating Facility to produce Renewable Energy from a Renewable Energy Source.

(15) "Renewable Energy Source" means the following sources of energy:

(a) Biomass;
(b) Biogas;
(c) Geothermal Energy;
(d) Landfill Gas;
(e) Sewage Treatment Plant Gas;
(f) Hydropower;
(g) Solar Radiation;
(h) Wind.

(16) "Wood-Burning Generating Facility" means a Renewable Energy Generating Facility that burns wood to generate electricity.

(17) "Wind Generating Facility" means a Renewable Energy Generating Facility that generates electricity from Wind.

Interconnection

At the request of a Renewable Energy Generator that places a Renewable Energy Generating Facility in service, the Company shall interconnect such Renewable Energy Generating Facility to the electric system of the Company, provided that technical requirements set forth in the Company's Rules relating to interconnection of generating facilities with the Company's electric system, as approved by the Public Utilities Commission, are met. Costs incurred by the Company to meet technical requirements of interconnection shall be allocated so that those costs that benefit a Renewable Energy Generating Facility are borne by the Renewable Energy Generator that uses the Renewable Energy Generating Facility to produce Renewable Energy, in conformity with orders of the Public Utilities Commission relating to distributed generation in the State of Hawaii. Each of the Company and the Renewable Energy Generator shall disclose to the other, within 6 weeks of a request by the other, any and all data, relating to the electric system of the Company or the Renewable Energy Generating Facility of the Renewable Energy Generator, necessary to plan and execute such interconnection in conformity with such technical requirements.

A Renewable Energy Generating Facility shall be designed to operate in parallel with the Company's electric system without adversely affecting the operations of its customers and without presenting safety hazards to personnel of the Company or its customers. The Renewable Energy Generator shall furnish, install, operate and maintain facilities such as relays, switches, synchronizing equipment, monitoring equipment and control and protective devices designated by the Company and specified in the standard Schedule FIT Agreement ("Schedule FIT Agreement") as suitable for parallel operation with the electric system of the Company. The Renewable Energy Generating Facility and systems interconnecting the Renewable Energy Generating Facility with the Company's electric system must be in compliance with all applicable safety and performance standards of the National Electric Code (NEC), the Institute of Electrical and Electronics Engineers (IEEE), and the Company's requirements for distributed generation interconnected with the Company's electric system as provided in the Company's Rules, and subject to any other requirements, including payments, as provided in the Schedule FIT Agreement.

Requests to interconnect a Renewable Energy Generating Facility in parallel with the Company's electric system will be processed in accordance with the procedures in Appendix II.

Schedule FIT Agreement:

The Company shall offer a Schedule FIT Agreement, in the form provided in Appendix I, to any Renewable Energy Generator that requests interconnection of a Renewable Energy Generating Facility to the electric system of the Company under this Schedule. Each such Schedule FIT Agreement shall oblige the Company to purchase and pay for all Renewable Energy generated by the Renewable Energy Generating Facility and delivered to the electric system of the Company, and to purchase and pay for all Renewable Energy that would be generated by the Renewable Energy Generating Facility and delivered to the electric system of the Company but for curtailment by the Company of generation or delivery of Renewable Energy by the Renewable Energy Generating Company, and shall oblige the Company to purchase and pay for all such Renewable Energy at the feed-in tariff rate of compensation (in cents per kilowatt-hour) set forth in this Schedule. The Company shall compensate the Renewable Energy Generator for such Renewable Energy in an amount no less than the number of kilowatt-hours of such Renewable Energy multiplied by such rate of compensation.

With respect to Renewable Energy generated by a Hybrid Facility and delivered to the electric system of the Company, each such Schedule FIT Agreement shall oblige the Company to take all such Renewable Energy, and shall oblige the Company to purchase and pay for such Renewable Energy generated by the Hybrid Facility from each Renewable Energy Source at the feed-in tariff rate of compensation (in cents per kilowatt-hour) for such Renewable Energy set forth in this Schedule.

Procedures for requesting and executing a Schedule FIT Agreement are provided in Appendix II to this Schedule.

Metering:

The Company, at its expense, shall install a meter to record the flow of Renewable Energy delivered to the electric system of the Company. The Renewable Energy Generator shall, at its expense, provide, install and maintain all conductors, service switches, fuses, meter sockets, meter instrument transformer housing and mountings, switchboard meter test buses, meter panels and similar devices required for service connection and meter installations on the premises of the Renewable Energy Generating Facility in accordance with the Company's Rules.

Any energy delivered to a Renewable Energy Generator by the Company will be metered separately from any Renewable Energy delivered by the Renewable Energy Generator to the Company, either by use of multiple meters or a meter capable of separately recording the net inflow and outflow of electricity.

Purchase of Renewable Energy Delivered by a Renewable Energy Generator to the Company:

The Company shall pay for each kilowatt-hour ("kWh") of Renewable Energy delivered to the Company by a Renewable Energy Generator as follows.

Renewable Energy Source: Biomass	
Wood-Burning Generating Facility Electrical Capacity (kW)	Feed-in Tariff Rate (¢/kWh)
≤ 150 kW	17.18
> 150 kW and ≤ 500 kW	13.51
> 500 kW and ≤ 5000 kW	12.18
> 5000 kW	11.45

Renewable Energy Source: Biomass	
Non-Wood-Burning Generating Facility Electrical Capacity (kW)	Feed-in Tariff Rate (¢/kWh)
≤ 150 kW	28.00
> 150 kW and ≤ 500 kW	24.00
> 500 kW and ≤ 5000 kW	22.00
> 5000 kW	21.00

Renewable Energy Source: Biogas	
Renewable Energy Generating Facility Electrical Capacity (kW)	Feed-in Tariff Rate (¢/kWh)
≤ 150 kW	17.18
> 150 kW and ≤ 500 kW	13.51

> 500 kW and ≤ 5000 kW	12.18
> 5000 kW and ≤ 20000 kW	11.45

Renewable Energy Source: Geothermal Energy	
Renewable Energy Generating Facility Electrical Capacity (kW)	Feed-in Tariff Rate (¢/kWh)
≤ 10000 kW	23.49
> 10000 kW	15.41

Renewable Energy Source: Landfill Gas or Sewage Treatment Plant Gas	
Renewable Energy Generating Facility Electrical Capacity (kW)	Feed-in Tariff Rate (¢/kWh)
≤ 500 kW	13.21
> 500 kW and ≤ 5000 kW	9.10

Renewable Energy Source: Hydropower	
Renewable Energy Generating Facility Electrical Capacity (kW)	Feed-in Tariff Rate (¢/kWh)
≤ 500 kW	18.60
> 500 kW and ≤ 2000 kW	12.70
> 2000 kW and ≤ 5000 kW	11.23
> 5000 kW and ≤ 10000 kW	8.62
> 10000 kW and ≤ 20000 kW	7.93
> 20000 kW and ≤ 50000 kW	5.86
> 50000 kW	4.70

Renewable Energy Source: Solar Radiation	
Photovoltaic Generating Facility Located on Oahu Electrical Capacity (kW)	Feed-in Tariff Rate (¢/kWh)
≤ 10 kW	47.9
≥ 10 kW and ≤ 100 kW	43.6
≥ 100 kW and ≤ 500 kW	39.6
≥ 500 kW and ≤ 5000 kW	36.3
≥ 5000 kW	33.0

Renewable Energy Source: Solar Radiation	
Photovoltaic Generating Facility Located on Maui Electrical Capacity (kW)	Feed-in Tariff Rate (¢/kWh)
≤ 10 kW	52.7
≥ 10 kW and ≤ 100 kW	47.9
≥ 100 kW and ≤ 500 kW	43.6
≥ 500 kW and ≤ 5000 kW	39.9
≥ 5000 kW	36.3

Renewable Energy Source: Solar Radiation	
Photovoltaic Generating Facility Located on Molokai Electrical Capacity (kW)	Feed-in Tariff Rate (¢/kWh)
≤ 10 kW	57.5
≥ 10 kW and ≤ 100 kW	52.3
≥ 100 kW and ≤ 500 kW	47.5
≥ 500 kW and ≤ 5000 kW	43.6

Renewable Energy Source: Solar Radiation	
Photovoltaic Generating Facility Located on Lanai Electrical Capacity (kW)	Feed-in Tariff Rate (¢/kWh)
≤ 10 kW	57.5
≥ 10 kW and ≤ 100 kW	52.3
≥ 100 kW and ≤ 500 kW	47.5
≥ 500 kW and ≤ 5000 kW	43.6

Renewable Energy Source: Solar Radiation	
Photovoltaic Generating Facility Located on Hawaii Electrical Capacity (kW)	Feed-in Tariff Rate (¢/kWh)
≤ 10 kW	53.7
≥ 10 kW and ≤ 100 kW	48.8
≥ 100 kW and ≤ 500 kW	44.4
≥ 500 kW and ≤ 5000 kW	40.7
≥ 5000 kW	37.0

Renewable Energy Source: Solar Radiation	
Concentrating Solar Power Facility Located on Oahu Electrical Capacity (kW)	Feed-in Tariff Rate (¢/kWh)
≤ 500 kW	39.6
> 500 kW and ≤ 5000 kW	36.3
> 5000 kW and ≤ 10000 kW	33.0
> 10000 kW and ≤ 20000 kW	30.0

Renewable Energy Source: Solar Radiation	
Concentrating Solar Power Facility Located on Maui Electrical Capacity (kW)	Feed-in Tariff Rate (¢/kWh)
≤ 500 kW	43.6
> 500 kW and ≤ 5000 kW	39.9
> 5000 kW and ≤ 10000 kW	36.3
> 10000 kW and ≤ 20000 kW	34.3

Renewable Energy Source: Solar Radiation	
Concentrating Solar Power Facility Located on Molokai Electrical Capacity (kW)	Feed-in Tariff Rate (¢/kWh)
≤ 500 kW	47.5
> 500 kW and ≤ 5000 kW	43.6

Renewable Energy Source: Solar Radiation	
Concentrating Solar Power Facility Located on Lanai Electrical Capacity (kW)	Feed-in Tariff Rate (¢/kWh)
≤ 500 kW	47.5
> 500 kW and ≤ 5000 kW	43.6

Renewable Energy Source: Solar Radiation	
Concentrating Solar Power Facility Located on Hawaii Electrical Capacity (kW)	Feed-in Tariff Rate (¢/kWh)
≤ 500 kW	44.4
> 500 kW and ≤ 5000 kW	40.7
> 5000 kW and ≤ 10000 kW	37.0
> 10000 kW and ≤ 20000 kW	35.0

Renewable Energy Source: Wind	
Onshore Wind Generating Facility Located on Oahu Electrical Capacity (kW)	Feed-in Tariff Rate (¢/kWh)
≤ 10 kW	
> 10 kW and ≤ 50 kW	
> 50 kW and ≤ 250 kW	
> 250 kW and ≤ 500 kW	
> 500 kW and ≤ 1000 kW	
> 1000 kW and ≤ 2500 kW	
> 2500 kW and ≤ 5000 kW	
> 5000 kW and ≤ 20000 kW	

Renewable Energy Source: Wind	
Onshore Wind Generating Facility Located on Maui Electrical Capacity (kW)	Feed-in Tariff Rate (¢/kWh)
≤ 10 kW	
> 10 kW and ≤ 50 kW	
> 50 kW and ≤ 250 kW	
> 250 kW and ≤ 500 kW	
> 500 kW and ≤ 1000 kW	
> 1000 kW and ≤ 2500 kW	
> 2500 kW and ≤ 5000 kW	
> 5000 kW and ≤ 20000 kW	

Renewable Energy Source: Wind	
Onshore Wind Generating Facility Located on Molokai Electrical Capacity (kW)	Feed-in Tariff Rate (¢/kWh)
≤ 10 kW	
> 10 kW and ≤ 50 kW	
> 50 kW and ≤ 250 kW	
> 250 kW and ≤ 500 kW	
> 500 kW and ≤ 1000 kW	
> 1000 kW and ≤ 2500 kW	
> 2500 kW and ≤ 5000 kW	
> 5000 kW and ≤ 20000 kW	

Renewable Energy Source: Wind	
Onshore Wind Generating Facility Located on Lanai Electrical Capacity (kW)	Feed-in Tariff Rate (¢/kWh)
≤ 10 kW	
> 10 kW and ≤ 50 kW	
> 50 kW and ≤ 250 kW	
> 250 kW and ≤ 500 kW	
> 500 kW and ≤ 1000 kW	
> 1000 kW and ≤ 2500 kW	
> 2500 kW and ≤ 5000 kW	
> 5000 kW and ≤ 20000 kW	

Renewable Energy Source: Wind	
Onshore Wind Generating Facility Located on Hawaii Electrical Capacity (kW)	Feed-in Tariff Rate (¢/kWh)
≤ 10 kW	
> 10 kW and ≤ 50 kW	
> 50 kW and ≤ 250 kW	
> 250 kW and ≤ 500 kW	
> 500 kW and ≤ 1000 kW	
> 1000 kW and ≤ 2500 kW	
> 2500 kW and ≤ 5000 kW	
> 5000 kW and ≤ 20000 kW	

Renewable Energy Source: Wind	
Offshore Wind Generating Facility Years of Agreement Term	Feed-in Tariff Rate (¢/kWh)
Years 1 through 12	
Years 13 through 20	

The Commission shall periodically adjust the Schedule FIT feed-in tariff rates of compensation in accordance with the procedures provided in Appendix III of this Schedule. The Renewable Energy Generator shall receive the feed-in tariff rate of compensation in effect at the time of execution of the Schedule FIT Agreement for the entire term of the Schedule FIT Agreement.

Term of Schedule FIT Agreement:

The term of the Schedule FIT Agreement will be as follows, commencing on the initial delivery of Renewable Energy under the Schedule FIT Agreement from the Renewable Energy Generator to the Company:

Renewable Energy Source	Term of Agreement
Biomass	20 years
Biogas	20 years
Geothermal Energy	20 years
Landfill Gas	20 years
Sewage Treatment Plant Gas	20 years
Hydropower	20 years
Solar Radiation	20 years
Wind	20 years

Net Energy Metering

A Renewable Energy Generator that is eligible to enter into a net energy metering agreement with the Company shall have a choice of either (1) entering into a net energy metering agreement with the Company, or (2) entering into a Schedule FIT Agreement with the Company.

Penetration Limits for Intermittent Renewable Energy Sources

The obligations of the Company to interconnect a Renewable Energy Generating Facility to the Company's electric system and to offer an Schedule FIT Agreement to a Renewable Energy Generator to purchase and pay for Renewable Energy at a feed-in tariff rate of compensation under this Schedule shall not apply with respect to Renewable Electricity produced by a Renewable Energy Generating Facility that is (i) a Wind Generating Facility, and that is placed in service after December 31 of the year following the year during which the aggregate Electrical Capacity of Renewable Energy Generating Facilities that are Wind Generating Facilities as to which technical requirements for interconnection have been met equals or exceeds 25 per cent of the peak demand for such electrical system, provided that the Public Utilities Commission may increase, by rule or order, such aggregate Electrical Capacity limit above 25 per cent of such peak demand, or (ii) a Photovoltaic Generating Facility or a Concentrating Solar Generating Facility, and that is placed in service after December 31 of the year following the year during which the aggregate Electrical Capacity of Renewable Energy Generating Facilities that are Photovoltaic Generating Facilities or Concentrating Solar Generating Facilities as to which technical requirements for interconnection have been met equals or exceeds 20 per cent of the peak demand for such electrical system, provided that the Public Utilities Commission may increase, by rule or order, such aggregate Electrical Capacity limit above the above-referenced 25 per cent and 20 per cent peak demands.

Queuing Procedures:

Requests for interconnection of Renewable Energy Generating Facilities under this Schedule shall be administered on a first-ready, first-to-interconnect basis, modeled after the queuing procedures adopted by the Midwest Independent Transmission System Operator, Inc. *See* Midwest Independent Transmission System Operator ("Midwest

ISO"), Generator Interconnection Process Tariff (August 25, 2008) http://www.midwestmarket.org/publish/Document/ 25f0a7_11c1022c619_-7d600a48324a/Attachment%20X%20GIP.pdf?action=download&_property=Attachment; Midwest ISO, Business Practices Manual: Generator Interconnection (Manual No. 15, TP-BPM-004-r2, January 6, 2009) http://www.midwestmarket.org/publish/Document/45e84c_11cdc615aa1_-7e010a48324a.

Renewable Energy Certificates:

Any certificate, credit, allowance, green tag, or other transferable indicia or environmental attribute, verifying the generation of a particular quantity of energy from a Renewable Energy Source, indicating the generation of a specific quantity of Renewable Energy by a Renewable Energy Generating Facility, or indicating a Renewable Energy Generator's ownership of any environmental attribute associated with such generation, is the property of the Renewable Energy Generator and freely assignable by the Renewable Energy Generator.

CERTIFICATE OF SERVICE

I hereby certify that I have this date filed and served the original and eight copies of the foregoing **FINAL STATEMENT OF POSITION AND PROPOSAL FOR FEED-IN TARIFF OF ZERO EMISSIONS LEASING LLC** in Docket No. 2008-0273, by hand delivery to the Commission at the following address:

CARLITO CALIBOSO
PUBLIC UTILITIES COMMISSION
465 S. King Street, Suite 103
Honolulu, HI 96813

I hereby further certify that I have this date served two copies upon the following party of the foregoing **FINAL STATEMENT OF POSITION AND PROPOSAL FOR FEED-IN TARIFF OF ZERO EMISSIONS LEASING LLC** in Docket No. 2008-0273, by causing such copies or copy thereof to be mailed, postage prepaid, and properly addressed to each such party as follows:

CATHERINE P. AWAKUNI
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DIVISION OF CONSUMER ADVOCACY
P.O. Box 541
Honolulu, HI 96809

I hereby further certify that I have this date served one copy upon each of the following parties, of the foregoing **FINAL STATEMENT OF POSITION AND PROPOSAL FOR FEED-IN TARIFF OF ZERO EMISSIONS LEASING LLC** in Docket No. 2008-0273, by causing each such copy thereof to be sent via e-mail in a portable document format ("pdf") to each such party as follows:

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